General

Guideline Title

Stable coronary artery disease.

Bibliographic Source(s)

Goblirsch G, Bershow S, Cummings K, Hayes R, Kokoszka M, Lu Y, Sanders D, Zarling K. Stable coronary artery disease. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2013 May. 71 p. [98 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Institute for Clinical Systems Improvement (ICSI). Stable coronary artery disease. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2011 Apr. 58 p.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC) and the Institute for Clinical Systems Improvement (ICSI): For a description of what has changed since the previous version of this guidance, refer to Summary of Changes Report -- May 2013 (see the "Guideline Availability" field). In addition, ICSI has made a decision to transition to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system. This document is in transition to the GRADE methodology. Transition steps incorporating GRADE methodology for this document include the following:

- Priority placed upon available systematic reviews in literature searches.
- All existing Class A (randomized controlled trials [RCTs]) studies have been considered as high quality evidence unless specified differently by a work group member.
- All existing Class B, C and D studies have been considered as low quality evidence unless specified differently by a work group member.
- All existing Class M and R studies are identified by study design versus assigning a quality of evidence (see Crosswalk between ICSI Evidence Grading System and GRADE below in the "Definitions" section).
- All new literature considered by the work group for this revision has been assessed using GRADE methodology.

The recommendations for stable coronary artery disease are presented in the form of two algorithms, accompanied by detailed annotations. Algorithms are provided in the original guideline document at the ICSI Web site (see the "Guideline Availability" field). The main algorithm for Stable Coronary Artery Disease has 20 components and addresses the evaluation and overall management of the patient with the disease. The second algorithm, with 11 components, addresses Pharmacologic Therapy. Clinical highlights and selected annotations (numbered to correspond with the algorithms) follow.

Class of evidence (Low Quality, Moderate Quality, High Quality, Meta-analysis, Systematic Review, Decision Analysis, Cost-Effectiveness Analysis, Guideline, and Reference) definitions are repeated at the end of the "Major Recommendations" field.

Clinical Highlights

- Prescribe aspirin in patients with stable coronary artery disease if there are no medical contraindications. (*Annotation #2, 21a; Aim #1*)
- Evaluate and treat the modifiable risk factors, which include smoking, sedentary activity level, depression, hyperlipidemia, obesity, hypertension, and diabetes. (*Annotation #5; Aim #3*)
- Patients with chronic stable coronary artery disease should be on statin therapy regardless of their lipid levels unless contraindicated. (*Annotation #21a; Aim #3*)
- Perform prognostic testing in patients whose risk determination remains unclear. This may precede or follow an initial course of pharmacologic therapy. (*Annotations #7; Aim #5*)
- Refer the patient for cardiovascular consultation when clinical assessment indicates the patient is at high risk for adverse events, the non-invasive imaging study or electrocardiography indicates the patient is at high risk for an adverse event, or medical treatment is ineffective. (*Annotations #15, 16; Aim #4*)
- For relief of angina, prescribe beta-blockers as first line medication. If beta-blockers are contraindicated, nitrates are the preferred alternative. Calcium channel blockers may be an alternative medication if the patient is unable to take beta-blockers or nitrates. (*Annotation #21a, 21e; Aim #1*)

Stable Coronary Artery Disease Algorithm (Main Algorithm) Annotations

1. Patients with Stable Coronary Artery Disease
   This guideline applies to patients with coronary artery disease either with or without angina. The population of patients with chronic coronary disease includes patients with stable angina, prior myocardial infarctions (MIs), prior percutaneous revascularization, coronary artery bypass graft (CABG), angiographically proven coronary atherosclerosis, or reliable non-invasive evidence of myocardial ischemia.

   A patient presenting with angina must meet the all the following criteria *[Low Quality Evidence]*:

   - Symptom complex has remained stable for at least 60 days
   - No significant change in frequency, duration, precipitating causes, or ease of relief of angina for at least 60 days
   - No evidence of recent myocardial damage

   The patient may already have undergone some diagnostic workup as a result of a prior presentation of chest pressure, heaviness, and/or pain with or without radiation of the pain and/or shortness of breath. The clinician should have heightened awareness that many patients have atypical symptoms that reflect cardiac ischemia, especially patients with diabetes, women and the elderly. Initial care of such patients falls under the auspices of the NGC summary of the ICSI guideline Diagnosis and treatment of chest pain and acute coronary syndrome (ACS).

   Refer to the original guideline document for updated information on definition and diagnosis of MI.

2. Perform Appropriate History, Physical Examination, Laboratory Studies, and Patient Education
   Recommendation:

   - Patients with stable coronary artery disease should have clinical risk assessment of future cardiovascular events.

   Thorough history taking and physical examination including medication and compliance reviews, are important to confirm diagnosis, to assist in risk stratification, and to develop a treatment plan *[Low Quality Evidence]*. Important points to elicit on history taking are:

   - Recognition that women may have atypical symptoms of cardiac ischemia. These may include fatigue, shortness of breath (SOB) without chest pain, nausea and vomiting, back pain, jaw pain, dizziness and weakness *[Low Quality Evidence]*
   - History of previous heart disease
   - Possible non-atheromatous causes of angina pectoris (e.g., aortic stenosis)
   - Comorbid conditions affecting progression of coronary artery disease
   - Symptoms of systemic atherosclerosis (e.g., claudication, transient ischemic attacks [TIAs], and bruits)
   - Severity and pattern of symptoms of angina pectoris

   The physical examination should include a thorough cardiovascular examination as well as evaluation for evidence of hyperlipidemia, hypertension, peripheral vascular disease, heart failure, anemia, thyroid disease, and renal disease.

   Initial laboratory studies should include an electrocardiogram and a fasting lipid profile (total cholesterol, high-density lipoprotein [HDL] cholesterol, calculated low-density lipoprotein [LDL] cholesterol, and triglycerides). Further tests, based on history and physical examination findings, may include chest x-ray, measurement of hemoglobin, and tests for diabetes, thyroid function, and renal function.

An important aspect to treatment of stable coronary artery disease is education to help the patient understand the disease processes, prognosis, treatment options, and signs of worsening cardiac ischemia so that prompt medical assistance is sought when necessary and appropriate. Education may be accomplished in a number of ways among the various medical groups. It may be ongoing, occur in a formal class, and/or be done at the clinician visit. Instruction on the proper use of aspirin and sublingual nitroglycerin, as needed, should also be reviewed at this time.

Shared Decision-Making

Stable coronary artery disease patients can experience clinical situations, most often symptoms of angina or other signs of coronary ischemia, that lead to decision options they face with their family and clinicians. These decisions may involve stress imaging and coronary angiography; based on these results, further discussion involves the cardiologist, the primary care clinician and sometimes a cardiovascular surgeon. All attempts should be made to clearly discuss and outline the different risks and benefits of medical therapy combined with or as an option to revascularization therapies. While the patient and primary care clinician often depend greatly on the expertise of the specialists, every attempt should be made to share decision-making with the patient, especially when alternative treatment options yield similar clinical benefits. This can be done via personal care conferences involving the patient's family and providing relevant clinical data. Tools such as Crucial Conversations and other decision support tools can help the patient evaluate his or her decisions in light of personal values and other contributing factors. Please see Appendix A, "ICSI Shared Decision-Making Model," in the original guideline document.

5. Address Modifiable Risk Factors and Comorbid Conditions
Recommendation:

- Depression should be routinely screened for and appropriately treated in patients with coronary heart disease.

Comorbid conditions that could affect myocardial ischemia may include hypertension, anemia, thyroid disease, hypoxemia, and others.

Modifiable risk factors for coronary heart disease need to be evaluated and may include smoking, inadequate physical activity, depression, hyperlipidemia, obesity, hypertension, and diabetes mellitus. Intervention involving any risk factor pertinent to the patient is encouraged and may include education, goal setting, and follow-up as necessary *[Low Quality Evidence]*.

See Appendix B, "Comorbid Conditions," in the original guideline document for treatment recommendations in the presence of comorbid conditions.

Emerging Risk Factors

An association between homocysteine levels and cardiovascular disease has been demonstrated. The NORVIT trial and HOPE 2 trial found that folate and vitamins B6 and B12 did not reduce the risk of recurrent cardiovascular events in patients with vascular disease. These supplements cannot be recommended as routine treatment in patients with stable coronary artery disease *[High Quality Evidence]*.

Lipoprotein (a) and highly sensitive C-reactive protein (hsCRP) may be valuable in select patients with diffuse coronary disease or diffuse atherosclerosis in multiple locations, particularly in those of young age *[Low Quality Evidence]*. Highly sensitive C-reactive protein has been shown to identify patients at higher risk of vascular events. Despite that, the main problem with widespread implementation of this marker is low specificity of hsCRP, lack of multiple trials confirming its additive value to traditional risk factors, lack of specific therapy and difficulties in sorting out the benefit of statin beyond LDL modification.

Influenza and Pneumonia Vaccination

Patients with cardiovascular disease should have an influenza vaccination as recommended by the American College of Cardiology/American Heart Association (ACC/AHA) Chronic Stable Coronary Artery Disease guideline *[Guideline]*.

It is also recommended that pneumonia vaccination be administered according to the Centers for Disease Control and Prevention (CDC) 2010 Updated Recommendations for Prevention of Invasive Pneumococcal Disease Among Adults. Using the 23-valent pneumococcal polysaccharide vaccine (PPSV23) for patients between 19 to 64 years old with diagnosis of chronic stable angina (chronic heart disease), a PPSV23 should be administered at the time of diagnosis, and another dose of PPSV23 should be repeated when the patients become 65 years old or later if at least five years have passed since their previous dose. Those who receive PPSV23 at or after age 65 years should receive only a single dose *[Guideline]*.

Smoking

Cigarette smoking may cause an acute cardiac ischemic event and may interfere with the efficacy of medications to relieve angina.

Sedentary Activity Level

An important aspect of the clinician's role is to counsel patients regarding appropriate work, leisure activities, and eating habits. Patients should be encouraged to exercise regularly to obtain cardiovascular benefit and to enhance their quality of life. The American College of Cardiology endorses a minimum schedule of 30 minutes of aerobic activity, such as brisk walking at least five (preferably seven) times per week, supplemented by an increase in daily lifestyle activities (walking breaks at work, gardening, etc.). Medically supervised programs are recommended for moderate- to high-risk patients. Exercise can be an important adjunct to modification of risk factors such as hypertension, hyperlipidemia, and obesity. In addition, it can enhance patients' perception of their quality of life. Strenuous activities should be modified if they produce severe or prolonged angina; caution is needed to avoid consistent reproduction of ischemic symptoms or situations that may precipitate ischemic complications. Education is critical in achieving these goals.

Refer to the original guideline document for Physical Activity Guidelines for Americans recommendations and benefits of physical activity.

Depression

Depressive symptoms are common in stable coronary artery disease patients, with prevalence estimates ranging from 15% to 30% *[Low Quality Evidence]*. The American Heart Association recommends that depression be routinely screened for and appropriately treated in patients with coronary heart disease *[Low Quality Evidence]*. A tool such as the Patient Health Questionnaire (PHQ-9) can be useful to support the patient in processing the changes they are experiencing *[Low Quality Evidence]*.

Based on the evidence from several studies, selective serotonin reuptake inhibitors (SSRIs) are preferred in the treatment of stable coronary artery disease patients with major depression. It is also prudent not to exceed maximum SSRI daily dose due to possible risk of QTc prolongations (http://www.fda.gov/Drugs/DrugSafety/ucm297391.htm).

Please see the NGC summary of the ICSI guideline Adult depression in primary care for more information on the treatment of depression.

Hyperlipidemia

A fasting lipid profile should be evaluated for appropriate patients with stable coronary artery disease. Secondary prevention is important in these patients who should be treated aggressively for hyperlipidemia. Many patients will require both pharmacologic and non-pharmacologic interventions to reach target goals. Target goals for hyperlipidemic patients with coronary artery disease include:

- LDL - less than 100 mg/dL for all patients, ideal less than 70 mg/dL especially for high-risk patients
- HDL - 40 mg/dL or greater
- Triglycerides - less than 150 mg/dL

Please refer to the ICSI guideline Lipid management in adults for recommendations on lowering lipid levels.

Obesity

The American Heart Association considers obesity to be a major risk factor for coronary artery disease. Obesity is defined as a body mass index greater than or equal to 30. Body mass index (BMI) provides a reasonable indicator of excess body fat that may lead to health problems. Obesity is a major risk factor for cardiovascular disease, certain types of cancer, dyslipidemia, hypertension and type 2 diabetes. Of adults age 20 or older, two-thirds are considered to be overweight or obese and more than one-third are considered to be obese *[Low Quality Evidence]*.

Waist circumference (WC) is also an important measurement because evidence suggests that abdominal fat is particularly a strong determinant of cardiovascular risk in those with a BMI of 25 to 34.9 kg/m^2. Men are at high relative risk if they have a WC greater than 40 inches; women are at high risk if they have a WC >35 inches.

The initial target goal of weight-loss therapy for overweight patients is to decrease body weight by about 10%. The rationale for this initial goal is that even moderate weight loss (e.g., 10% of initial body weight) can significantly decrease the severity of obesity-associated risk factors.

Hypertension

General health measures include the treatment of hypertension, which is not only a risk factor for development and progression of atherosclerosis, but also causes cardiac hypertrophy, augments myocardial oxygen requirements, and thereby intensifies myocardial ischemia in patients with obstructive coronary disease.

The recommended target blood pressure is 140/90 mm Hg or less. Based on current evidence, pursuing blood pressure goals lower than 140/90 should be considered on an individual patient basis based on clinical judgment and patient preference *[High Quality Evidence]*,

[Meta-analysis].

Diabetes

Diabetes is associated with a marked increase in coronary artery disease. Patients with diabetes without known coronary artery disease have as high risk of MI as patients without diabetes with coronary artery disease. Therefore, patients with diabetes should have aggressive lipid and blood pressure management (similar to patients with coronary artery disease), and should be treated per the recommendations of the ICSI guidelines Diagnosis and management of type 2 diabetes mellitus in adults and Lipid management in adults .

Please refer to the NGC summary of the ICSI guideline Diagnosis and management of type 2 diabetes mellitus in adults for recommendations regarding management of diabetes.

Every attempt should be made to achieve meticulous glucose control in patients with diabetes, because there is a clear relationship between lower hemoglobin A1c and lower risk of MI *[Low Quality Evidence]*.

Refer to the original guideline document for information regarding results of the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial.

Hormone Therapy (HT)

Risk-benefit analyses unequivocally support NOT starting HT for primary prevention. Should a patient already on HT present with acute coronary syndrome or be at risk for venous thromboembolism (e.g., prolonged immobilization), HT should be discontinued immediately. Clinical judgment is required in making the decision whether to continue HT in other circumstances.

Cardiac Rehabilitation (CR) Referral

CR services are comprehensive, long-term programs involving medical evaluation, prescribed exercise, cardiac risk factor modification, education and counseling. These programs are designed to limit the physiological and psychological effects of cardiac illness, reduce the risk for sudden death or re-infarction, control cardiac symptoms, stabilize or reverse the atherosclerotic process, and enhance the psychosocial and vocational status of selected patients *[Guideline]*.

Patients who are considered eligible for CR include those who have experienced one or more of the following conditions as a primary diagnosis sometime within the previous year *[Guideline]*:

- MI/acute coronary syndrome
- Coronary artery bypass graft surgery
- Percutaneous coronary intervention
- Stable angina
- Heart valve repair/replacement
- Heart transplantation

6. Assessment Yields High Clinical Risk of Adverse Event?
   Some patients are considered to be at high risk for infarction or death on the basis of history, physical examination, and initial laboratory findings. Patients presenting with accelerating symptoms of angina (New York Heart Association [NYHA] Class III or IV, see Appendix C, "Grading Angina Pectoris," in the original guideline document), symptoms of peripheral vascular disease, or symptoms of left ventricular dysfunction should be referred to a cardiologist unless precluded by other medical conditions.

7. Need for Prognostic Testing?
   Prognostic testing is appropriate for patients in whom risk determination remains unclear after the initial evaluations have been completed, or in whom cardiac catheterization is deemed inappropriate by the cardiologist. Prognostic testing may precede or follow an initial course of pharmacologic therapy *[Low Quality Evidence]*. Please see ACC/AHA guideline on stress testing, which is an excellent resource for determining appropriate testing. Specific test depends on the expertise of your organization *[Low Quality Evidence]*.

8. Patient/Electrocardiogram Allows Exercise Electrocardiography?
   Sensitivity of exercise electrocardiography (Masters 2-Step Exercise Test, Graded Exercise Test, Bicycle Test, Ergometry) may be reduced for patients unable to reach the level of exercise required for near maximal effort, such as:

   Baseline electrocardiogram (ECG) abnormalities:

- Patients taking beta-blockers
- Patients in whom fatigue, dyspnea, or claudication symptoms develop
- Patients with vascular, orthopedic, or neurological conditions who cannot perform leg exercises

Imaging stress tests have advantages in the following conditions:

- Left bundle branch block (LBBB)
- Wolff-Parkinson-White Syndrome (WPW)
- Pace rhythm
- Left ventricular hypertrophy (LVH) with strain
- >1 mm ST segment depression at rest
- Digoxin therapy
- Prior coronary revascularization

9. Perform Exercise Electrocardiography
   Most patients with normal resting electrocardiograms who can exercise and are not taking digoxin can undergo standard treadmill exercise testing.

10. Perform Non-Invasive Imaging Study
    A non-invasive imaging study such as myocardial perfusion scintigraphy or stress echocardiography should best meet the patient's needs while providing the most clinical usefulness and cost-effectiveness within the clinician's institution. An imaging study should be selected through discussion with the cardiologist or imaging expert *[Low Quality Evidence]*.

11. Results Yield Moderate to High Risk of Adverse Event?
    Exercise electrocardiography and stress test imaging studies may yield results that indicate high, intermediate or indeterminate, or low risk of adverse clinical events. High- and intermediate-risk patients, based on results of stress testing, should have a cardiology consultation for discussion of the risks and benefits of medical therapy, invasive procedures and revascularization options. Patients who are indeterminate risk may benefit from cardiology consultation and/or further noninvasive imaging. Low-risk patients can generally be managed medically, with a good prognosis. Low-risk patients may benefit from angiography if the diagnosis remains unclear; however, angiography is unlikely to alter outcome in these patients.

    Refer to the original guideline document for information on benefits of coronary revascularization and risk of future cardiovascular events.

12. Initiate/Modify Medical Therapy
    In 2007 the COURAGE (Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation) trial implemented a rigorous therapeutic program for what has become known as optimal medical therapy (OMT). Over a median of 4.6 years, 2,207 patients with objective evidence of myocardial ischemia were randomized to either percutaneous coronary intervention (PCI) plus OMT, or OMT alone. The primary composite outcome (death from any cause or non-fatal MI) and secondary outcomes (death, MI, cardiovascular accident) were no different between the two treatment arms *[Low Quality Evidence]*.

    A multidisciplinary approach for intensive lifestyle modification and medication therapy is the preferred approach in treating stable coronary artery disease patients. The initial medication treatment goal for stable coronary artery disease should include the following:

    - For smoking, the goal was cessation.
    - For total dietary fat, the goal was <30% of calories and for saturated fat, <7% of calories.
    - For dietary cholesterol, the goal was <200 mg/day.
    - For physical activity, the goal was 30 to 45 minutes of moderate intensity five times a week.
    - For body weight by BMI for those with a 25 to 27.5 BMI, the goal is <25 BMI; for those with >27.5 BMI, the goal is 10% relative weight loss.
    - For blood pressure, the goal was <140/90 mm Hg.
    - For LDL cholesterol, the goal was <100 mg/dL; <70 mg/dL was preferred for a high-risk group.
    - For diabetes HbA1c, the goal was <7.0%. The A1c goal should be individualized based on each patient's particular cardiovascular risk factors.
    - Screen for depression.
    - Receive an annual influenza vaccination.
    - Receive a pneumonia vaccination.

13. Is Medical Treatment Effective?

Medical therapy is proven to be effective in treatment of symptoms and reduction of cardiovascular events in patients who underwent comprehensive cardiovascular evaluation. Although coronary revascularization relieves symptoms almost immediately, the long-term outcomes are equal in the medically treated and in those who receive the percutaneous intervention. A meta-analysis of randomized trials that compared intensive medical treatment of stable coronary artery disease patients with initial coronary stenting concluded similar rate of death, MI, unplanned revascularization or angina over 4.3 years of follow-up *[High Quality Evidence]*.

Comprehensive therapy including successful risk factor modification is of paramount importance. In the COURAGE trial, the goals of intensive therapy were achieved in over 80% of patients by utilization of protocol driven and administered by a nurse case manager systematic approach. This suggests that secondary prevention model (nurse case manager implementing behavioral assessment, counseling tools and treatment algorithms) is successful in initiating and maintaining positive lifestyle changes, the appropriate use and titration of medications to achieve treatment targets *[Moderate Quality Evidence]*.

14. Follow Regularly to Assess Risk Factors, Profile, Responses to Treatment
There is no consensus in the literature regarding frequency of follow-up; ongoing management needs and follow-up should be individualized *[Low Quality Evidence]*.

    Work group consensus recommends, at a minimum, clinical follow up every 4 to 6 months during the first year following diagnosis and then every 6 to 12 months as long as the condition remains stable. Laboratory follow-up consists of a lipid panel yearly and 3 to 4 months after change in therapy. Basic metabolic panel should be done yearly. Patients should be strongly encouraged to call their clinician with symptom changes.

    Patient perception of symptoms may impact the effect of the symptoms on quality of life and medical management.

    Refer to Appendix C, "Grading of Angina Pectoris," in the original guideline document for information on grading angina pectoris.

15. Worsening in Angina Pattern?
A new occurrence of angina or a worsening in the chronic stable angina pattern is considered to be present when any of the following occur:

    - The symptom complex becomes less stable.
    - There is a change in frequency, duration, precipitating causes, or ease in relief of angina.
    - There is evidence of recent myocardial damage.

16. Change Suggests Need for Cardiology Referral?
When such change is no longer managed by alterations in the pharmacologic therapy prescribed, cardiology consultation or referral for possible invasive intervention may be appropriate *[Guideline, Low Quality Evidence]*.

    See Appendix C, "Grading Angina Pectoris," in the original guideline document for information on grading angina pectoris.

20. Percutaneous Transluminal Coronary Angioplasty (PTCA), Coronary Artery Bypass Graft (CABG) or Other Revascularization Procedures
The relative benefits of revascularization compared with medical therapy are enhanced by an increase in absolute number of severely narrowed coronary arteries, the degree of left ventricular systolic dysfunction and the magnitude of myocardial ischemia. Among patients with lesser disease, PTCA and CABG have not been shown to reduce mortality or the risk of MI, but do reduce the symptoms of angina and the intensity of antianginal therapy, as well as increase exercise capacity.

    Although the actual intervention of an invasive modality such as angiography, PTCA, or CABG is outside this guideline and may be found within another, those patients undergoing such procedures may, at best, be restored to a chronic stable anginal pattern, thus continuing to receive medical treatment under the purview of this guideline.

    Aggressive modification of cardiac risk factors in the COURAGE trial should be pursued if similar clinical results are to be obtained.

    These interventions include (when clinically appropriate):

    - Beta-blocker, non-dihydropyridine calcium channel blocker and/or nitrate, with angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blocker (ARB)
    - Aggressive HMG-CoA reductase inhibitor (3-hydroxy-3-methyl-glutaryl-CoA reductase inhibitor, statin) therapy alone or in combination to target LDL of 70 mg per deciliter
    - Antiplatelet therapy

    [High Quality Evidence]

Pharmacologic Algorithm Annotations

21a. Educate Patient on Medication Therapy

Recommendation:

- The use of one aspirin tablet daily (81 mg) is strongly recommended unless there are medical contraindications.

Antiplatelet Therapy

The use of one aspirin tablet daily (81mg) is strongly recommended unless there are medical contraindications *[High Quality Evidence]*, *[Low Quality Evidence]*.

It remains difficult to conclude whether enteric-coated aspirin is gastro-protective or not, but clinicians should not assume that it is any safer than regular or buffered aspirin, and should treat it with the same level of caution.

Patients for whom aspirin is contraindicated (or insufficient) should be treated with clopidogrel 75 mg daily indefinitely *[Low Quality Evidence]*.

In appropriately selected patients, an aspirin dose of 81 mg is recommended for patients who are on chronic clopidogrel therapy. Different doses of aspirin may apply in the setting of acute coronary syndrome; refer to the NGC summary of the ICSI guideline Diagnosis and treatment of chest pain and acute coronary syndrome (ACS) for aspirin dosing.

In patients who have undergone drug-eluting stent (DES) placement for treatment of coronary artery disease, continuation of dual antiplatelet therapy with aspirin and thienopyridine is expected for a period of at least one year in the absence of contraindications *[Low Quality Evidence]*. The importance of continued dual antiplatelet therapy during this period should be discussed with patients in an effort to improve compliance, and instructions should be given to contact a health care clinician prior to discontinuation of antiplatelet therapy for elective surgical or dental procedures. Due to the risk of catastrophic stent thrombosis, cessation of antiplatelet therapy should be carefully considered during the first year after DES implantation and particularly during the first three (post-sirolimus-eluting stent) or six months (paclitaxel-eluting stent). In combination with clopidogrel, the dose of aspirin should be 81 mg. Refer to the NGC summary of ICSI guideline Diagnosis and treatment of chest pain and acute coronary syndrome (ACS) *[Low Quality Evidence]*. Aspirin should be prescribed to all patients with stable coronary disease. If the patient is aspirin intolerant, use clopidogrel.

Statins – HMG-CoA reductase inhibitors (3-hydroxy-3-methyl-glutaryl-CoA reductase)

Many patients will require both pharmacologic and non-pharmacologic interventions to reach target goals. Target goals for hyperlipidemic patients with coronary artery disease include:

- LDL - less than 100 mg/dL for all patients, ideal less than 70 mg/dL especially for high-risk patients
- HDL - 40 mg/dL or greater
- Triglycerides - less than 150 mg/dL

There is now an *ideal* LDL-cholesterol (LDL-C) goal of less than 70 mg/dL for patients considered to be very high risk. Several trials have shown clinical benefit using high dose statins to treat to lower LDL levels.

At present the clinician will need to individualize therapy with statins by the degree of risk in their patients, considering a target LDL of 70 or less, especially for patients at highest risks. Very high risk patients include patients with established cardiovascular disease plus any of the following: 1) multiple major risk factors, such as diabetes; 2) severe or poorly controlled risk factors, especially smoking; 3) metabolic syndrome associated risk factors (triglycerides greater than 200 mg/dL, HDL less than 40 mg/dL); and 4) patients with acute coronary syndromes. The benefits in reducing cardiac events with high-dose statin therapy will need to be weighed against the higher potential for side effects, and the potential for increased non-cardiac mortality as seen in the TNT trial, which is either real, or due to chance. Further trials comparing different treatment intensities of statins should bring more clarity regarding which patients benefit most with the least side effects *[High Quality Evidence]*.

Refer to the NGC summary of the ICSI guideline Lipid management in adults for recommendations on cholesterol lowering.

Every effort should be made to ensure all patients with coronary artery disease receive optimal lipid therapy. Statin medications are strongly supported as first-line medications due to compelling evidence of mortality reduction from multiple clinical trials *[High Quality Evidence]*.

If patients are intolerant to a statin, clinicians are strongly encouraged to have the patient try other statins in reduced doses before ruling out all statins.

The PROSPER trial showed a significant risk reduction in MI in the elderly; therefore, age alone should not preclude treatment. The Heart Protection Study also showed benefit in patients up to age 80 years *[High Quality Evidence]*.

Patients with chronic stable coronary artery disease should be on statin therapy regardless of their lipid levels unless contraindicated.

As-Needed Nitrates

In patients with mild stable coronary artery disease, drug therapy may be limited to short-acting sublingual nitrates on an as-needed basis. Use of lower dose (e.g., 0.3 mg or one-half of a 0.4-mg tablet) may reduce the incidence of side effects such as headache or hypotension in susceptible patients.

Beta-Blocking Agents

Beta-blockers should be used in all status post-MI patients, based on studies showing mortality reduction. They are also the preferred first-line therapy for reducing symptoms of angina in patients with stable coronary artery disease. Drugs with intrinsic sympathomimetic activity should be avoided. Abrupt withdrawal of all beta-blockers should be avoided *[High Quality Evidence]*, *[Low Quality Evidence]*.

Ranolazine

Ranolazine is a stand-alone late sodium channel blocker; it relieves stable angina symptoms and increases exercise tolerance. It demonstrates antianginal and anti-ischemic effects without changing hemodynamic parameters (heart rate or blood pressure). Consider the use of ranolazine when beta-blockers, calcium channel blockers and nitrates are not adequately effective or are not tolerated *[Guideline]*. Ranolazine is not a first-line drug and should be used in conjunction with a cardiologist.

21b. Nutritional Supplement Therapy

The American Heart Association *[Guideline]* recommends inclusion of omega-3 fatty acids in patients with stable coronary artery disease because of evidence from randomized controlled trials.

The recommended daily amount of omega-3 fatty acids in patients with stable coronary artery disease is 1 gram of eicosapentaenoic acid (EPA) plus docosahexaenoic acid (DHA) by capsule supplement or by eating at least two 4-ounce servings per week of fatty fish. The amounts of omega-3 fatty acids in various foods are found in Appendix D in the original guideline document. To obtain the recommended daily amount of 1,000 mg EPA plus DHA per day, patients ought to be counseled in the proper way to interpret the supplement label. The goal is to consume 1,000 mg of EPA plus DHA, but not all omega-3 in a fish oil concentrate is EPA and DHA. The product label defines what constitutes a dose. Because there is variation in doses across products, it is necessary to calculate the EPA and DHA amount per dose, and consume the number of doses that together equate one gram *[Low Quality Evidence]*. For example, if one serving size is two softgels, each serving containing 360 mg EPA plus 240 mg DHA, one would take two servings (four softgels) to attain the recommended dose of at least 1,000 mg of EPA plus DHA per day.

In addition to EPA and DHA supplements, patients with stable coronary artery disease should be encouraged to follow a diet rich in alpha-linolenic acid (ALA). According to published data, 1.5 gram to 3 grams ALA per day appears to benefit the general population, and those at risk of heart disease also demonstrate benefit (based on level III evidence) *[Low Quality Evidence]*. Plant-based sources of omega-3 fatty acids would be ground flax seed, flax seed oil, walnuts, walnut oil, canola oil, soybeans and soybean oil. Fish meals can be difficult for patients to maintain, and there are issues of potential environmental contaminants including mercury, polychlorinated biphenyl (PCB), dioxin and others. Because of this, capsule supplements may be preferred, although there is no uniformity of EPA and DHA content or purity. Patients should consult their health clinicians or nutritionists regarding this issue.

Dietary and non-dietary intake of n-3 polyunsaturated fatty acids may reduce overall mortality, mortality due to MI, and sudden death in patients with stable coronary artery disease *[Low Quality Evidence]*.

High doses of vitamin E supplement (greater than 400 IU/day) may increase or cause mortality and should be avoided *[High Quality Evidence]*, *[Meta-analysis]*.

21c. Use of ACE Inhibitors for Risk Reduction

Among patients with stable angina, ACE inhibitors are most beneficial to patients with left ventricular dysfunction post-MI, persistent hypertension, and diabetes *[High Quality Evidence]*. Patients with normal left ventricular function who also have hypertension, type II diabetes mellitus or chronic kidney disease should be on ACE inhibitors *[High Quality Evidence]*. If the patient cannot tolerate ACE inhibitors, a potential substitute would be ARBs *[High Quality Evidence]*.

The degree of benefit needs to be assessed individually and may depend on patient characteristics *[Meta-analysis]*.

21d. Does Patient Need Daily Antianginal Therapy?

The decision to initiate daily drug therapy for coronary artery disease is based upon the symptom complex of the patient in combination with findings from the history, physical examination, laboratory studies, and prognostic testing *[High Quality Evidence]*, *[Low Quality Evidence]*.

21e. Prescribe Antianginal Therapy

Beta-Blocking Agents

Beta-blockers should be used in all status post-myocardial infarction patients, based on studies showing mortality reduction. They are also the preferred first-line therapy for reducing symptoms of angina in patients with stable coronary artery disease. Drugs with intrinsic sympathomimetic activity should be avoided. Abrupt withdrawal of all beta-blockers should be avoided *[High Quality Evidence]*, *[Low Quality Evidence]*.

Long-Acting Nitrates

If beta-blockers cannot be prescribed as first-line therapy, nitrates are the preferred alternative first-line therapy because of efficacy, low cost, and relatively few side effects. Tolerance to long-acting nitrates is an important clinical issue in some patients and can be avoided by appropriate daily nitrate-free intervals *[Low Quality Evidence]*.

Adverse Interactions between Nitrates and Phosphodiesterase-5 Inhibitors

Patients with stable coronary artery disease should be advised that due to potentially life-threatening hypotension, phosphodiesterase-5 inhibitors (such as sildenafil, vardenafil, and tadalafil) are contraindicated if they have used nitrates within the last 24 hours.

In any patient evaluated for acute coronary insufficiency, nitrates must also be avoided if there is a history of phosphodiesterase-5 inhibitor use in the previous 24 to 48 hours (avoid nitrates for 24 hours after sildenafil and vardenafil; avoid nitrates for 48 hours after tadalafil). All other interventions, including all non-nitrate antianginal medications may be used for these patients.

Calcium Channel Blockers

For patients who are unable to take beta-blockers or long-acting nitrates, the use of calcium channel blockers has been shown to be clinically effective in decreasing symptoms of angina. Calcium channel blockers have not been proven to reduce mortality. Because beta-blockers have reduced mortality in the post-myocardial infarction period, they are the preferred agent for patients with stable coronary artery disease *[Low Quality Evidence]*. Dihydropyridines as monotherapy may exacerbate angina during dose initiation or titration.

21g. Prescribe Additional Therapy

Additional therapy may be necessary in selected patients, but it increases side effects and cost. A combination of beta-blockers and long-acting nitrates is preferred because of cost, efficacy, and reduced potential for adverse side effects *[Low Quality Evidence]*, *[High Quality Evidence]*. The following factors should be considered when beta-blockers and calcium channel blockers are combined *[Low Quality Evidence]*:

- This combination may not be better than either agent used alone in maximum tolerated doses.
- If angina persists at the maximum optimal dose of beta-blocker, addition of a calcium channel blocker is likely to reduce angina and improve exercise performance.
- With left ventricular dysfunction, sinus bradycardia, or conduction disturbances, combination treatment with non-dihydropyridine calcium channel blockers and beta-blockers should be avoided or initiated with caution. In patients with

conduction system disease, dihydropyridine calcium channel blocker can be considered.

- Monitor peripheral edema if the combination of dihydropyridines and long-acting oral nitrates are needed for symptom control because both are potent vasodilators.
- If side effects prohibit increased doses but symptoms persist, selected patients may need low doses of multiple drug therapy.

21h. Additional Therapy Effective?

If after several attempts at adjusting the medications a therapeutic combination is not achieved for the patient, a cardiology consultation or referral may be appropriate.

Definitions:

Following a review of several evidence rating and recommendation writing systems, Institute for Clinical System Improvement (ICSI) has made a decision to transition to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system.

Crosswalk between ICSI Evidence Grading System and GRADE

ICSI GRADE System	**Previous ICSI System**	
High, if no limitation	**Class A:**	Randomized, controlled trial
Low	**Class B:**	[observational]
		Cohort study
	Class C:	[observational]
		Non-randomized trial with concurrent or historical controls
Low		Case-control study
Low		Population-based descriptive study
***Low**		Study of sensitivity and specificity of a diagnostic test
*Following individual study review, may be elevated to Moderate or High depending upon study design		
	Class D:	[observational]
Low		Cross-sectional study
		Case series
		Case report
Meta-analysis	**Class M:**	Meta-analysis
Systematic Review		Systematic review
Decision Analysis		Decision analysis
Cost-Effectiveness Analysis		Cost-effectiveness analysis
Low	**Class R:**	Consensus statement
Low		Consensus report
Low		Narrative review
Guideline	**Class R:**	Guideline

ICSI GRADE System	Previous ICSI System	
Low	**Class X:**	Medical opinion

Evidence Definitions

High Quality Evidence = Further research is very unlikely to change confidence in the estimate of effect.

Moderate Quality Evidence = Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.

Low Quality Evidence = Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate or any estimate of effect is very uncertain.

In addition to evidence that is graded and used to formulate recommendations, additional pieces of literature will be used to inform the reader of other topics of interest. This literature is not given an evidence grade and is instead identified as a Reference throughout the document.

Clinical Algorithm(s)

Detailed and annotated clinical algorithms are provided in the original guideline document (see the "Guideline Availability" field) for:

- Stable Coronary Artery Disease
- Pharmacologic Therapy

Scope

Disease/Condition(s)

Stable coronary artery disease with or without angina

Other Disease/Condition(s) Addressed

- Asthma
- Atrioventricular block
- Chronic obstructive pulmonary disorder
- Diabetes mellitus
- Headaches
- Hypertension
- Hyperthyroidism
- Hypertrophic cardiomyopathy
- Peripheral vascular disease
- Rapid atrial fibrillation (with digitalis)
- Raynaud's syndrome
- Sinus bradycardia
- Sinus tachycardia
- Supraventricular tachycardia
- Ventricular arrhythmias

Guideline Category

Counseling

Evaluation

Management

Risk Assessment

Treatment

Clinical Specialty

Cardiology

Family Practice

Internal Medicine

Nutrition

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Dietitians

Health Care Providers

Health Plans

Hospitals

Managed Care Organizations

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

- To increase the percentage of patients age 18 years and older with a diagnosis of stable coronary artery disease, who are prescribed aspirin and anti-atherosclerotic medications
- To increase the percentage of patients age 18 years and older with a diagnosis of stable coronary artery disease who understand the self-management of their condition
- To increase the percentage of patients age 18 years and older with a diagnosis of stable coronary artery disease who receive education and an intervention for modifiable risk factors
- To increase the use of angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs) in patients with stable coronary artery disease with systolic congestive heart failure (CHF) (ejection fraction less than or equal to 40%), including those patients with a comorbidity diagnosis of chronic kidney disease and/or diabetes mellitus
- To increase appropriate risk assessment and stress imaging for stable coronary artery disease patients to determine risk stratification prior to decisions on medical therapy and revascularization

Target Population

Adults age 18 years or older who have a diagnosis of stable coronary artery disease. The criteria includes patients presenting with:

- Previously diagnosed coronary artery disease without angina, or symptom complex that has remained stable for at least 60 days
- No change in frequency, duration, precipitating causes or ease of relief of angina for at least 60 days
- No evidence of recent myocardial damage

Interventions and Practices Considered

Evaluation/Risk Assessment

1. History, physical examination, laboratory studies, and patient education
2. Addressing modifiable risk factors and comorbid conditions
    - Influenza and pneumonia vaccination
    - Smoking
    - Sedentary activity level
    - Depression
    - Hyperlipidemia
    - Obesity
    - Hypertension
    - Diabetes
    - Hormone therapy
    - Cardiac rehabilitation referral
3. Exercise electrocardiography and stress testing

Treatment/Management

1. Intensive lifestyle modification
2. Patient education on medication therapy
3. Cardiac catheterization and revascularization procedures (percutaneous transluminal coronary angioplasty [PTCA], coronary artery bypass graft [CABG])
4. Pharmacologic therapy
    - Antiplatelet therapy
    - Statins
    - As-needed nitrates
    - Beta-blocking agents
    - Ranolazine
5. Nutritional supplement therapy
    - Omega-3 fatty acids
    - Diet rich in alpha-linolenic acid (ALA)
6. Angiotensin-converting enzyme (ACE) inhibitors for risk reduction
7. Antianginal therapy
    - Beta-blocking agents
    - Long-acting nitrates
    - Calcium channel blockers
8. Combination therapy

Major Outcomes Considered

- Morbidity and mortality associated with coronary artery disease
- Safety of pharmacologic agents

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

A consistent and defined process is used for literature search and review for the development and revision of Institute for Clinical Systems Improvement (ICSI) guidelines. The literature search was divided into two stages to identify systematic reviews (stage I) and randomized controlled trials, meta-analyses and other literature (stage II). Literature search terms used for this revision are below and include literature from July 2009 through November 2012.

In performing the literature search, the following data bases were used: PubMed, Cochrane Library, Agency for Healthcare Research and Quality (AHRQ).

The search terms used were stable coronary artery disease; vitamin D; stations; hypertension; high blood pressure; hyperlipidemia; medical treatment versus revascularization; depression; obesity; SSRIs; sustained release niacin; age, gender and ethnicity; beta-blockers; homocysteine; amiodarone; refractory angina; diabetes; exercise electrocardiography and aspirin.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Following a review of several evidence rating and recommendation writing systems, the Institute for Clinical System Improvement (ICSI) has made a decision to transition to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system.

Crosswalk between ICSI Evidence Grading System and GRADE

ICSI GRADE System	**Previous ICSI System**	
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		Cohort study
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		Non-randomized trial with concurrent or historical controls
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Low		Population-based descriptive study
***Low**		Study of sensitivity and specificity of a diagnostic test
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	Class D:	[observational]
Low		Cross-sectional study

ICSI GRADE System	Previous ICSI System	
		Case series Case report
Meta-analysis	**Class M:**	Meta-analysis
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Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

New Guideline Development Process

A work group consisting of 6 to 12 members that includes physicians, nurses, pharmacists, and other healthcare professionals relevant to the topic, along with an Institute for Clinical Systems Improvement (ICSI) staff facilitator develops each document. Ordinarily, one of the physicians will be

the leader. Most work group members are recruited from ICSI member organizations, but if there is expertise not represented by ICSI members, 1 or 2 members may be recruited from medical groups, hospitals, or other organizations that are not members of ICSI. Patients on occasion are invited to serve on work groups.

The work group will meet for 7 to 8 three-hour meetings to develop the guideline. A literature search and review is performed and the work group members, under the coordination of the ICSI staff facilitator, develop the algorithm and write the annotations and footnotes and literature citations.

Once the final draft copy of the guideline is developed, the guideline goes to the ICSI members for critical review.

Revision Process of Existing Guidelines

ICSI scientific documents are revised every 12 to 24 months as indicated by changes in clinical practice and literature. For documents that are revised on a 24-month schedule, ICSI checks with the work group on an annual basis to determine if there have been changes in the literature significant enough to cause the document to be revised earlier or later than scheduled. For yearly reviewed documents, ICSI checks with every work group 6 months before the scheduled revision to determine if there have been changes in the literature significant enough to cause the document to be revised earlier than scheduled.

Literature Search

ICSI staff, working with the work group to identify any new pertinent clinical trials, systematic reviews, or regulatory statements and other professional guidelines, conduct a literature search.

Revision

The work group will meet for 1 to 2 three-hour meetings to review the literature, respond to member organization comments, and revise the document as appropriate.

A second review by members is indicated if there are changes or additions to the document that would be unfamiliar or unacceptable to member organizations. If a review by members is not needed, the document goes to the appropriate steering committee for approval according to the criteria outlined in the "Description of Method of Guideline Validation" field.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Critical Review Process

The purpose of critical review is to provide an opportunity for the clinicians in the member groups to review the science behind the recommendations and focus on the content of the guideline. Critical review also provides an opportunity for clinicians in each group to come to consensus on feedback they wish to give the work group and to consider changes necessary across systems in their organization to implement the guideline.

All member organizations are expected to respond to critical review guidelines. Critical review of guidelines is a criterion for continued membership within the Institute for Clinical Systems Improvement (ICSI).

After the critical review period, the guideline work group reconvenes to review the comments and make changes, as appropriate. The work group

prepares a written response to all comments.

Document Approval

Each document is approved by the Committee for Evidence-Based Practice (CEBP).

The committee will review and approve each guideline/protocol, based on the following criteria:

- The aim(s) of the document is clearly and specifically described.
- The need for and importance of the document is clearly stated.
- The work group included individuals from all relevant professional groups and had the needed expertise.
- Patient views and preferences were sought and included.
- The work group has responded to all feedback and criticisms reasonably.
- Potential conflicts of interest were disclosed and do not detract from the quality of the document.
- Systematic methods were used to search for the evidence to assure completeness and currency.
- Health benefits, side effects, risks and patient preferences have been considered in formulating recommendations.
- The link between the recommendation and supporting evidence is clear.
- Where the evidence has not been well established, recommendations based on community practice or expert opinion are clearly identified.
- Recommendations are specific and unambiguous.
- Different options for clinical management are clearly presented.
- Clinical highlights and recommendations are easily identifiable.
- Implementation recommendations identify key strategies for *health care systems* to support implementation of the document.
- The document is supported with practical and useful tools to ease *clinician* implementation.
- Where local resource availability may vary, alternative recommendations are clear.
- Suggested measures are clear and useful for quality/process improvement efforts.

Once the document has been approved, it is posted on the ICSI Web site and released to members for use.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is classified for selected recommendations (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate assessment and management of stable coronary artery disease or without angina

Potential Harms

- In patients with left ventricular dysfunction, sinus bradycardia, or conduction disturbances, combination treatment with non-dihydropyridine calcium channel blockers and beta-blockers should be avoided or initiated with caution.
- Dihydropyridines as monotherapy may exacerbate angina during dose initiation or titration.
- Monitor for peripheral edema if the combination of dihydropyridines and long-acting oral nitrates is needed for symptom control because both are potent vasodilators.
- Nitrates are associated with headache and hypotension in susceptible patients. Tolerance to long-acting nitrates is an important clinical issue in some patients and can be avoided by appropriate daily nitrate-free intervals.
- Abrupt withdrawal of all beta-blockers should be avoided.
- Combination therapy may be necessary in selected patients, but it increases side effects and cost.
- High-dose statin therapy has a higher potential for side effects, including myalgias and elevated liver enzymes.

- It is prudent not to exceed maximum selective serotonin reuptake inhibitor (SSRI) daily dose due to possible risk of QTc prolongations.

Contraindications

Contraindications

Adverse Interactions between Nitrates and Phosphodiesterase-5 Inhibitors

Patients with stable coronary artery disease should be advised that due to potentially life-threatening hypotension, phosphodiesterase-5 inhibitors (sildenafil, vardenafil, and tadalafil) are contraindicated if they have used nitrates within the last 24 hours.

In any patient evaluated for acute coronary insufficiency, nitrates must also be avoided if there is a history of phosphodiesterase-5 inhibitor use in the previous 24 to 48 hours (avoid nitrates for 24 hours after sildenafil and vardenafil; avoid nitrates for 48 hours after tadalafil).

Aspirin

Examples of precautions/contraindications to aspirin are:

- Patients allergic to aspirin
- Patients with gastrointestinal disorders
  - Recent gastrointestinal bleeding and active treatment for peptic ulcer disease are contraindications.
- Patients with recent intracranial bleeding
  - Intracranial bleeding within the past six weeks is a contraindication.
  - Any history of intracranial bleeding necessitates evaluation on a case-by-case basis.
- Patients with bleeding disorders or those receiving other anticoagulants
- Patients with uncontrolled hypertension
  - Systolic blood pressure is greater than 180 mm Hg
  - Diastolic blood pressure is greater than 110 mm Hg
- Patients regularly taking non-steroidal anti-inflammatory drugs (NSAIDs)
  - Combined use of aspirin and NSAIDs may increase risk of bleeding. Enteric-coated aspirin with careful monitoring for clinical signs of gastropathy may be an acceptable strategy for patients regularly taking NSAIDs. Use of NSAIDs and cyclooxygenase-2 (COX-2) inhibitors may reduce the cardioprotective benefits of aspirin. Regular, not intermittent, use of NSAIDs inhibits the clinical benefits of aspirin. Caution should be used in prescribing COX-2 inhibitors to patients with coronary artery disease, because there is evidence of a class effect on cardiovascular risks.

Qualifying Statements

Qualifying Statements

- The information contained in this Institute for Clinical Systems Improvement (ICSI) Health Care Guideline is intended primarily for health professionals and other expert audiences.
- This ICSI Health Care Guideline should not be construed as medical advice or medical opinion related to any specific facts or circumstances. Patients and families are urged to consult a health care professional regarding their own situation and any specific medical questions they may have. In addition, they should seek assistance from a health care professional in interpreting this ICSI Health Care Guideline and applying it in their individual case.
- This ICSI Health Care Guideline is designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition.

Implementation of the Guideline

Description of Implementation Strategy

Description of Implementation Strategy

Once a guideline is approved for general implementation, a medical group can choose to concentrate on the implementation of that guideline. When four or more groups choose the same guideline to implement and they wish to collaborate with others, they may form an action group.

In the action group, each medical group sets specific goals they plan to achieve in improving patient care based on the particular guideline(s). Each medical group shares its experiences and supporting measurement results within the action group. This sharing facilitates a collaborative learning environment. Action group learnings are also documented and shared with interested medical groups within the collaborative.

Currently, action groups may focus on one guideline or a set of guidelines such as hypertension, lipid treatment, and tobacco cessation.

Detailed measurement strategies are presented in the original guideline document to help close the gap between clinical practice and the guideline recommendations. Summaries of the measures are provided in the National Quality Measures Clearinghouse (NQMC).

Implementation Recommendations

Prior to implementation, it is important to consider current organizational infrastructure that address the following:

- System and process design
- Training and education
- Culture and the need to shift values, beliefs and behaviors of the organization

The following system changes were identified by the guideline work group as key strategies for health care systems to incorporate in support of the implementation of this guideline:

- Develop systems for providing patient education around:
  - Proper use of nitroglycerin
  - Consistent use of aspirin (unless contraindicated) or consistent use of clopidogrel as directed
  - When to call 911

  Education should also provide for patient to "teach back" in order to demonstrate their understanding of what they should do in an acute cardiac event.

- Develop/provide patients education materials around use of aspirin (unless contraindicated) and interventions around modifiable risk factors.
- Provide patient education around the use and benefits of angiotensin-converting enzymes (ACE) inhibitors and/or angiotensin II receptor blockers (ARBs).

Implementation Tools

Clinical Algorithm

Quality Measures

Quick Reference Guides/Physician Guides

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Related NQMC Measures

Stable coronary artery disease: percentage of patients with stable coronary artery disease who are prescribed aspirin and anti-atherosclerotic medications.

Stable coronary artery disease: percentage of patients with stable coronary artery disease who have demonstrated an understanding of how to respond in an acute cardiac event by "teaching back" as to how they would respond in the case of acute cardiac event.

Stable coronary artery disease: percentage of patients who smoke with documentation in the medical record that advice to quit was provided and/or help to quit was provided.

Stable coronary artery disease: percentage of patients with cardiovascular disease who received an annual influenza vaccination.

Stable coronary artery disease: percentage of patients with documentation in the medical record of receiving a pneumonia vaccination according to the CDC recommendations.

Stable coronary artery disease: percentage of patients with documentation in the medical record of physical activity goal and when the goal was met.

Stable coronary artery disease: percentage of patients who were screened for depression using the PHQ-9.

Stable coronary artery disease: percentage of patients with documentation in the medical record that an LDL was obtained within the last 12 months with an LDL less than 100 mg/dL. Consider less than 70 mg/dL for high-risk patient.

Stable coronary artery disease: percentage of patients with a documented blood pressure in the medical record of 140/90 mmHg or less.

Stable coronary artery disease: percentage of patients with diabetes with a documented HbA1c of less than 7.0% or meeting the patient's individualized HbA1c goal.

Stable coronary artery disease: percentage of patients with diagnosis of stable coronary artery disease with systolic CHF (ejection fraction less than or equal to 40%) who are prescribed an ACE inhibitor or ARB.

Stable coronary artery disease: percentage of patients with a diagnosis of stable coronary artery disease and chronic kidney disease who are prescribed an ACE inhibitor or ARB.

Stable coronary artery disease: percentage of patients with a diagnosis of stable coronary artery disease and hypertension who are prescribed an ACE inhibitor or ARB.

Stable coronary artery disease: percentage of patients with documentation in the medical record of prognostic assessment preceding or following a course of pharmacologic therapy.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Goblirsch G, Bershow S, Cummings K, Hayes R, Kokoszka M, Lu Y, Sanders D, Zarling K. Stable coronary artery disease. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2013 May. 71 p. [98 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

1994 Jul (revised 2013 May)

Guideline Developer(s)

Institute for Clinical Systems Improvement - Nonprofit Organization

Guideline Developer Comment

The Institute for Clinical Systems Improvement (ICSI) is comprised of 50+ medical group and hospital members representing 9,000 physicians in Minnesota and surrounding areas, and is sponsored by five nonprofit health plans. For a list of sponsors and participating organizations, see the ICSI Web site.

Source(s) of Funding

- The Institute for Clinical Systems Improvement (ICSI) provided the funding for this guideline. The annual dues of the member medical groups and sponsoring health plans fund ICSI's work. Individuals on the work group are not paid by ICSI, but are supported by their medical group for this work.
- ICSI facilitates and coordinates the guideline development and revision process. ICSI, member medical groups, and sponsoring health plans review and provide feedback, but do not have editorial control over the work group. All recommendations are based on the work group's independent evaluation of the evidence.

Guideline Committee

Committee on Evidence-Based Practice

Composition of Group That Authored the Guideline

Work Group Members: Greg Goblirsch, MD (Work Group Leader) (River Falls Clinic) (Family Medicine); Spencer Bershow, MD (Fairview Health Services) (Family Medicine); Yun Lu, PharmD, MS (Hennepin County Medical Center) (Pharmacy); Kathy Zarling, RN, MS, CNS (Mayo Clinic) (Nursing); Marek Kokoszka, MD (Park Nicollet Health Services) (Cardiology); Debra M. Sanders, RD (River Falls Medical Clinic) (Dietetics); Kathy Cummings, RN, BSN, MA (Institute for Clinical Systems Improvement [ICSI]) (Project Manager); Rochelle Hayes, BS (ICSI) (Systems Improvement Coordinator)

Financial Disclosures/Conflicts of Interest

The Institute for Clinical Systems Improvement (ICSI) has long had a policy of transparency in declaring potential conflicting and competing interests of all individuals who participate in the development, revision and approval of ICSI guidelines and protocols.

In 2010, the ICSI Conflict of Interest Review Committee was established by the Board of Directors to review all disclosures and make recommendations to the board when steps should be taken to mitigate potential conflicts of interest, including recommendations regarding removal of work group members. This committee has adopted the Institute of Medicine Conflict of Interest standards as outlined in the report Clinical Practice Guidelines We Can Trust (2011).

Where there are work group members with identified potential conflicts, these are disclosed and discussed at the initial work group meeting. These members are expected to recuse themselves from related discussions or authorship of related recommendations, as directed by the Conflict of Interest committee or requested by the work group.

Disclosure of Potential Conflicts of Interest

Spencer Bershow, MD, Work Group Member
Family Medicine, Fairview Health Services
National, Regional, Local Committee Affiliations: None
Guideline Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: None

Greg T. Goblirsch, MD, Work Group Leader
Medical Director, Family Medicine, River Falls Clinic
National, Regional, Local Committee Affiliations: None
Guideline Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: None

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Guideline Related Activities: Acute Coronary Artery Disease (ICSI)
Research Grants: None
Financial/Non-Financial Conflicts of Interest: None

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National, Regional, Local Committee Affiliations: None
Guideline Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: None

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National, Regional, Local Committee Affiliations: None
Guideline Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: Registered Dietician Consultant, Lutheran Home, Long Term Care

Kathy Zarling, RN, MS, CNS, Work Group Member
Cardiovascular Clinical Nurse Specialist, Mayo Clinic
National, Regional, Local Committee Affiliations: None
Guideline Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: None

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Institute for Clinical Systems Improvement (ICSI). Stable coronary artery disease. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2011 Apr. 58 p.

Guideline Availability

Available for purchase from the Institute for Clinical Systems Improvement (ICSI) Web site . Also available to ICSI members for free at the ICSI Web site and to Minnesota health care organizations free by request at the ICSI Web site

Availability of Companion Documents

The following companion is provided to those who access the guideline (see the "Guideline Availability" field):

- Stable coronary artery disease. Executive summary. Bloomington (MN): Institute for Clinical Systems Improvement; 2013 May. 1 p.

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI on August 30, 1999. The information was verified by the guideline developer on October 11, 1999. This NGC summary was updated by ECRI on May 15, 2000 and on December 20, 2001. The information was verified by the guideline developer as of February 1, 2002. This NGC summary was updated by ECRI on July 8, 2004, July 8, 2005, June 14, 2006, June 21, 2007, and December 26, 2009. This NGC summary was updated by ECRI Institute on May 17, 2010 following the U.S. Food and Drug Administration advisory on Plavix (clopidogrel). This NGC summary was updated by ECRI Institute on July 15, 2011. This NGC summary was updated by ECRI Institute on April 13, 2012 following the U.S. Food and Drug Administration advisories on Statin Drugs and Statins and HIV or Hepatitis C drugs. This NGC summary was updated by ECRI Institute on August 26, 2013.

Copyright Statement

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